

# Gas Well “Smart” Automation System



Partner Reported Opportunities (PROs)  
for Reducing Methane Emissions

## PRO Fact Sheet No. 709

### Applicable sector(s):

☒ Production ☐ Processing ☐ Transmission and Distribution

Partners reporting this PRO: BP

**Other related PROs:** Install Plunger Lift Systems in Gas Wells, Use Foaming Agents, Install Velocity Tubing Strings, Gas Well Unloading Time Optimization

Compressors/Engines ☐  
Dehydrators ☐  
Pipelines ☐  
Pneumatics/Controls ☐  
Tanks ☐  
Valves ☐  
Wells ☒  
Other ☐

### Technology/Practice Overview

#### Description

Gas wells load up and cease to flow when their flow velocity is insufficient to force produced liquids to the surface. Options that are available to the producer are to shut-in the well allowing bottom hole pressure to increase, blow down the well to the atmosphere, or install some type of artificial lift system.

A plunger lift is a type of artificial lift that has been in use by the industry for some time to remove liquids from gas wells. Most plunger systems either operate on a fixed cycle or on a preset differential pressure. One partner has optimized its plunger lift and blowdown operations by installing a “Smart” Automation System on more than 2,200 wells.

The “Smart” Automation System monitors the well’s production parameters such as tubing and casing pressures, flow rate, and plunger arrival velocities. These remote telemetry units (RTUs) coupled with company proprietary software with “artificial intelligence” features and operation experience, improve well and venting performance. This system optimizes plunger operations and blowdown or shut-in cycles. It reports well problems and high-venting wells and tracks venting times to allow management of natural gas production and venting performance. This has enabled significant reductions in gas venting volumes along with production improvements.

#### Operating Requirements

“Smart” Automation System equipment must be installed on each well including a RTU, tubing and casing transmitters, gas measurement equipment, a control valve, and a plunger detector to optimize flow and reduce methane emissions. A host system capable of retrieving and presenting data is also required. Users can configure all controls and send them to the RTU from the host system. Training of field personnel and engineering time to improve the software code and optimize the system is required to maximize the benefits of the system. The system enables automated tracking of actual unloading times, estimated volumes, and results substantiation.

#### Applicability

The “Smart” Automation System is applicable to gas wells that produce some associated liquids and are subject to loading up.

### Methane Savings: 1,045 Mcf per year per well

#### Costs

Capital Costs – average per well (including installation)

☐ <\$1,000 ☐ \$1,000 – \$10,000 ☒ >\$10,000

Operating and Maintenance Costs (annual) per well

☐ <\$100 ☒ \$100-\$1,000 ☐ >\$1,000 – \$10,000

#### Payback (Years)

☐ 0–1 ☒ 1–3 ☐ 3–10 ☐ >10

#### Benefits:

Increased profits through the sale of previously vented gas volumes are the primary benefits of installing the “Smart” Automation Systems on gas wells. Increased recovery of reserves and reduced methane emissions are added benefits.

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## **Methane Emissions Reductions**

Methane is vented to the atmosphere during liquid unloading operations to restore gas wells to production. Savings are determined by comparing before and after unloading volumes and their frequency. Orifice meters can be used to establish gas blowdown flow rates and volumes for each type of well conditions and formation resulting in robust volume estimates. A partner reduced blowdown emissions 2.3 Bcf per year by installing the “Smart” Automation System (both plunger lift and blow down wells) on more than 2,200 wells in New Mexico’s San Juan Basin.

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## **Economic Analysis**

### **Basis for Costs and Savings**

Additional annual income of \$6.9 million based on a reduction in vented emissions of 2.3 Bcf of gas with a nominal value of \$3.00 per Mcf. The “Smart” Automation System can be installed at a cost of less than \$12,000 per well dependent on the number of wells, current automation and transmission systems in place, and the location. The system requires additional field personnel training and engineering time to realize its full benefits. The cost and time are justified by increased profits and reduced emissions.

### **Discussion**

Payout is in 1 to 3 years.